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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/058,454

01/28/2002

Andreas Falk

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4248

30593

7590

06/27/2005

HARNESS, DICKEY & PIERCE, P.L.C.

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EXAMINER

LAXTON, GARY L

ART UNIT

PAPER NUMBER

2838

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/058,454

Applicant(s)

FALK ET AL.

Examiner

Gary L. Laxton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-17 and 19-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-10,12,14-17 and 19-23 is/are rejected.
- 7) ☒ Claim(s) 11 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/17/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 2, 4-17 and 19-23 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4-10, 12, 14-16, 19 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhold et al (EP0820893) in view of Laeuffer (US 6,324,080).

Claims 1, 7 and 21. Reinhold et al in figure 6, disclose a primary converter for rail vehicles comprising partial current regulators (40.1-40.n); a transformer (40.1-40.n; see abstract line 4; e.g. each regulator comprises a transformer); a secondary converter (41.1-41.m); wherein the primary converter includes three primary converter sections (40.1-40.n) connected in series, see figure 6, output lines of each converter are connected to respective transformer primary windings (see abstract line 4 again).

However, Reinhold et al do not disclose each transformer primary winding having a resonance capacitor.

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Laeuffer teaches a converter circuit comprising a resonance capacitor C_r for providing a resonant tank circuit that is coupled to the inverter circuit.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Reinhold et al with the teachings of Laeuffer in order to provide a series resonant converter circuit to improve circuit efficiency as taught by Laeuffer.

Claim 2. See figures 1 and 2 of Reinhold.

Claims 4 and 5. Laeuffer also teaches an inductance coil L_r that forms an oscillating circuit with the capacitor.

Claim 6. The circuit resonates at the natural frequency.

Claims 8, 10 and 23. Reinhold et al disclose the claimed subject matter as stated in regards to claim 1 above except for a capacitor array.

Laeuffer teaches utilizing a capacitor array (C_1 and C_2) having a symmetrical magnetic and electric structure for lossless switching connected to a half bridge circuit in known fashion (col. 2 lines 4-10) for providing a half bridge resonant converting apparatus with circuit phase and time variables.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Reinhold et al with the teachings of Laeuffer in order to provide a half bridge resonant converting apparatus with circuit phase and time variables coupled to a capacitor array and to decouple the converter sections of Reinhold

Claims 9 and 22. Reinhold et al in view Laeuffer discloses the claimed invention except for operating switching elements at 1.2 or 1.4 times smaller than the resonance frequency. It would have been obvious to one having ordinary skill in the art at the time the invention was

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made switch at 1.2 or 1.4 times smaller than the resonance frequency, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 12. Reinhold et al disclose the four quadrant regulator compensates the resonance circuit. See figures 1 and 2.

Claim 14. Reinhold et al disclose the converters are synchronized.

Claim 15. Full bridge circuits are well known replacements for half bridge circuits.

Claim 16. Reinhold et al disclose the circuits can be switched out see figure 6.

Claim 19. The input voltage is connected to the output voltage through switches. See figures 1 and 2. Furthermore, Laeuffer in figure 1 shows additional inductances.

4. Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reinhold et al and Laeuffer (US 6,324,080) in view of Nomura (US 6,388,904).

Reinhold et al and Laeuffer disclose the claimed subject matter as stated in regards to claim 1 above except for using a switch and filter to operate the AC mains.

Nomura teaches a filter 4, 5 and input switch 6 to operate the mains AC power to the converter circuits and isolate it from the rest of the circuit in case of overloading.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a switch and filter to filter noise when in operation and to use the switch to isolate the circuit in overload situations.

Allowable Subject Matter

5. Claims 11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter: claims 11 and 13 are considered as having allowable subject matter as stated in the previous office action dated 3/13/03.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,946,206 Shimizu et al disclose plural parallel resonant power supplies having resonance capacitors.
8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L. Laxton whose telephone number is (571) 272-2079. The examiner can normally be reached on Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on (571) 272-2084. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Gary L. Laxton
Primary Examiner
Art Unit 2838
6/13/05